CARL Import and Export Utility

User's Manual

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I.   INTRODUCTION

The Carl Moyer Program is a grant program that funds the incremental cost of cleaner-than-required engines, equipment, and other sources of air pollution. The Clean Air Reporting Log (CARL) is an on-line project tracking tool for the Carl Moyer Program. The CARL database has two primary functions: (1) to calculate emission reductions, cost effectiveness and maximum grant amounts, and (2) to house program data for reporting.

Equipment data are entered into CARL either via source category online forms or via the import utility. The CARL import utility is a tool that allows the import of data in batches, making it possible to enter large amounts of data in a single uploaded file. The import utility has been revised for 2014 reporting to improve and enhance the data compilation and import processes. CARL is also equipped with an export utility that can be used to view and edit data. The export utility has been revised to match the import template, for uniformity, clarity, and ease of re-importing edited data. The revised import utility allows only new data to be imported. This means that the project or equipment that is being imported cannot already exist in the database.

To simplify the import utility, files for applicant/project, equipment, and engine data are combined into a single import file defined by source category. The redesigned import files will be referred to as "import templates" in this document.

This Import and Export User's Manual contains information and instructions about the CARL import and export features. It also provides guidelines on how to understand and use the import templates, as well as instructions on how to validate imported data in CARL.

Voucher Incentive Program (VIP) projects may not be imported into CARL; the VIP form should be used for such projects.

Two-for-one equipment replacement projects cannot be imported into CARL. In other words, projects that have two baseline equipment and one reduced cannot be entered using the import tool. Please use the Non-Calculation form to enter in these projects

II.   IMPORT TEMPLATES

This section of the Import and Export User's Manual covers concepts, qualifications, and definitions that are key to successful understanding and use of templates in the import utility.

The import templates are contained in an Excel workbook, one template to a worksheet. In addition to an Administration (admin) template, source category templates include the following:

- Agricultural Pumps (Ag Pump)

- Voluntary Accelerated Vehicle Retirement (VAVR)
- Marine
- On-Road Repower
- On-Road Replacement
- Off-Road (Repower-Retrofit)
- Off-Road Replacement
- Non-Calculation (Non-Calc)

Focusing each template on a specific source category allows unnecessary columns to be eliminated. This should reduce the chance of importing erroneous data and increase the likelihood of a successful import. Columns that are contained in the source category specific templates are the only columns that should be populated for each category. No additional columns should be added.

In the import templates data fields are most commonly labeled as "Copy," "Required," "Optional," "Reports," or are simply left blank. Other descriptive labels may also be in the noted in the field. Figure 1 illustrates this.

FIGURE 1: Example of Copy, Required, Optional, and Report fields

equipment_approved_amount	pre_inspection	post_inspection	discount_rate	cost_effectiveness_limit
Optional	Optional	Report	Required	Required
Copy[1]	Copy[1]	Copy[1]	Copy[1]	Copy[1]
District Grant Amount - otherwise CARL will default to the maximum grant amount	*Date of pre-inspection conducted*	*Date post-inspection conducted*	*Discount rate*	*Cost effectiveness limit*
Format: xxx.xx	*Format: yyyy-mm-dd*	*Format: yyyy-mm-dd*	*Percent should be entered in as decimal (ex. 2% as .02)*	*Format: xxx.xx*

A "Required" field must be populated for successful data import. When "Copy" is noted in the field, the identical data must appear on all pertinent data rows. An "Optional" field is voluntary and will not affect the import if left blank. *It should be noted, however, that the word "Optional" should not be left in the cell if the user does not intend to enter data in CARL; instead the cell should be made blank.* A "Reports" field identifies that the variable is a trigger for the required reports. Report triggers are based on the status of a particular piece of equipment or project and may or may not need to be filled in. Blank or empty fields are not intended to be filled in and should be left blank.

The CARL Import utility is particularly sensitive to textual and numeric formatting. Data entered into the database using the import utility must follow input requirements set in the import templates. The CARL database is case sensitive. For example, there are certain fields that pertain to yes or no questions, or that require a special code. Data for these fields must be entered as either an upper-case Y for yes or N for no, or as described in the data dictionary and domains. Filling in these boxes with a "yes" or a "no" or with lower-case letters will not allow for correct import. In addition, dates are a common type of formatting error. When entering dates, use the following format: yyyy-mm-dd.

Administration (Admin) Template: The funding, payment and withhold data fields in the admin template are used to enter fiscal and administrative information such as funding and payment amounts, funding sources and funding years. Each entry requires a separate data row. That is, multiple payments made on the same equipment require multiple data rows. For example, there must be a separate data row per funding amount, payment amount, and withhold amount. In addition there must be a separate data row if those amounts are for different funding sources or funding years. Figure 2 below provides an example administration import file which distinguishes the funding type, funding year, funding source and amount in separate import data rows.

FIGURE 2: Sample Administration Import Files

number	equipment_identifier	district_code	admin_type	funding_y	source	amount	admin_date
ARB-project 1-onroad	ARB - Project 1 - Big Truck	ARB	F	18	ME	10000	
ARB-project 1-onroad	ARB - Project 1 - Big Truck	ARB	F	18	ME	10000	
ARB-project 1-onroad	ARB - Project 1 - Big Truck	ARB	F	19	MD	1000	
ARB-project 1-onroad	ARB - Project 1 - Big Truck	ARB	P	19	ME	1000	2018-08-01
ARB-project 1-onroad	ARB - Project 1 - Big Truck	ARB	P	20	ME	500	2018-08-01
ARB-project 1-onroad	ARB - Project 1 - Big Truck	ARB	P	20	MD	1000	2018-08-01

Format for Saving Import Templates: The source category and admin templates must be saved as separate tab delimited text files. In the "save as" window in Microsoft Excel, click the "save as type" drop-down menu. Scroll down and select the "text (tab delimited) (*.txt)" file option. The Export utility also renders files in text format. For further information regarding opening text files see the Exporting section of this manual.

Data Order: The CARL Import Utility provides limited flexibility when formatting the templates. The column header names represent particular fields of data within the column and can be placed in any order. Columns that are not required and contain no data in the column may be deleted from the import template. Note that the export utility will export the columns in the order they appear in the source category templates.

Domains: Certain data fields require special text and codes that can be found in the templates and domains worksheets. In the source categories templates the descriptions under each column provide guidance for entering data. Some of the domain descriptions contain hyperlinks to the domains template where special text and codes can be found. Domain information has to be entered into the fields exactly as it appears, with no additional spaces or hard returns, for the import utility to work properly.
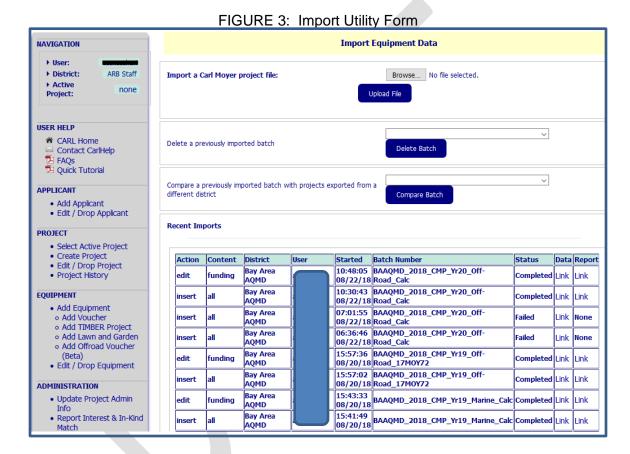
Data Dictionary: The data dictionary tab contains the name, description, and formatting requirements of every column available in the import utility. The data dictionary acts as a reference for the templates.

Maximum File Size: The import tool accepts files less than 15 Megabytes in size.

III.   IMPORTING

This section of the Import and Export User's Manual describes how to use the Import Utility. The import utility web form can be used to import data, delete batch files, assess the status of an import and track previously imported batches. When importing data, the source category information must be imported before associated administration information is imported.

To access the import utility form in CARL, select the "Import Data" link on the gray bar. The import utility form will appear, as depicted in Figure 3 below.

FIGURE 3: Import Utility Form

To import data, select the "Browse" button and navigate to the text file you would like to import, then select "Upload File." A validation algorithm will begin to check for erroneous data. If the validation check is successful, a link will appear to begin importing.

The file that was imported will appear in the "Recent Imports" table along with a Status of the import as either "Importing" or "Completed." The Content column identifies whether the import file was "all" for a source category import or "funding" for an administration import. The Recent Imports table also identifies the district the data was imported to, the user who imported, the date and time of the import, and the batch number. The Data link shows the data that was contained in the import file and the Reports link provides a log of the import. The

import utility may also inform the user if the import has failed because the batch number already exists in CARL, or if the import file is missing the required batch number.

Editing and Deleting projects in CARL: Only NEW data can be imported into CARL; editing existing data using the imports function is not possible. If a district wants to import information for projects or equipment that already exists in the database, the project or equipment data must first be removed from CARL by using the "drop" feature on the Edit / Drop project link on the web form. A second option would be to delete the batch number in the import utility web form, as discussed below.

Delete batch number: The import utility allows the user to delete previously imported batch numbers and their associated data. To do so, select the "Delete a Previously Imported Batch" link and navigate to the batch number you would like to delete. The import utility will then inform you if the batch number was successfully dropped.

IV.   IMPORTING FIELDS

This section of the Import and Export User's Manual addresses specific terms used in the templates and relationships among key fields. **Column for *batch_number*:** The CARL Import utility keeps track of projects entered within a particular import group via the *batch_number* field. The *batch_number* column joins or links the applicant, project, equipment, and engine information that is uploaded as a group during the initial batch import. Following this step, the admin template is imported. The admin template does not contain a column for a *batch_number* field, but instead becomes associated with a *batch_number* field through data association. The *batch_number* field describes the district, source category and batch of data uploaded (e.g.: ARB_VAVR_yr18). In case of the need to delete batches of import data, removing all of the project, equipment, engine, and administration information associated with the batch import will delete all import data within that desired *batch_number* group. All project entries within a particular batch import upload must have identical batch numbers.

Admin Data Association with Source Category Data: Source category import data are associated with administration import data through the *number* and *equipment_identifier* fields, which are unique to a district. The project *number* is a District supplied unique number that characterizes the project. The *equipment_identifier* is also a unique District supplied identifier that distinguishes a piece of equipment within a project. The admin template does not contain a column for a batch number field since the Source Category template is linked to all of the other batch data via the *number* and *equipment_identifier* data fields.

Required Reports: Certain fields need to be populated for the project to be displayed on the required reports. Those fields are highlighted in blue in the source category and admin templates. Below are the necessary logic and

triggers for the three required reports in CARL:

- Executed Contract Report – A project must have an executed contract date (*contract_exec*) and equipment must be funded to display in the required Executed Contract Report. That is, the source category template must have an executed contract date for the project and the admin template must have funding information for the equipment in the project. When a project with an executed contract date and funded equipment are imported into CARL, the sum total of the funded equipment in the project will display in the Executed Contract Report. In this case the trigger date is the executed contract date.
- Expended Report – For a project to be considered Expended, in addition to the Executed Contract requirements above, at least one piece of equipment in the project must be paid-in-full (*paid_in_full*) and post-inspected (*post_inspection*); then all funded equipment will be considered expended. In this case the trigger date is the post-inspection date.
- Liquidated Report – For a project to be considered liquidated, in addition to the Executed Contract and Expended requirements above, ALL funded equipment in the project must be paid-in-full (*paid_in_full*) and post-inspected (*post_inspection*). The trigger date is the final payment date and the liquidated amount is the paid and withheld amounts combined.

Baseline and reduced equipment vs. baseline and reduced engine:
Distinguishing between engine and equipment baseline and reduced data is especially critical to successful import. Repower and retrofit projects must have "reduced" in both data rows under the ***equipment_baseline_or_reduced.*** For example, if the category is Scrap, or Agricultural Pump repower the word "reduced" must be repeated in both data rows for the ***equipment_baseline_or_reduced***. On the other hand, if the category is an equipment replacement project – On-Road Replacement or Off-Road Equipment Replacement – the word "baseline" should be in the baseline equipment data row and the word "reduced" should be in the reduced equipment data row. Please do not confuse this with the ***engine_baseline_or_reduced***. This column distinguishes the baseline ENGINE from the reduced engine information. In every case, for all source categories (expect infrastructure and shore power), there must be baseline engine and reduced engine data provided.

Column for *engine_baseline_or_reduced*: The *engine_baseline_or_reduced* column is used to distinguish between the baseline engine and the reduced engine entries. The baseline and reduced engines must have separate data rows in the import template. Every equipment imported into CARL must have a baseline and reduced engine data row.

Multiple-engine columns *engines_installed* and *engine_number*: For equipment with more than one engine, the total number of engines is entered in the *engines_installed* column and the *engine_number* distinguishes the main and

auxiliary engines. The *main_or_aux* column distinguishes if it is a main/propulsion engine or auxiliary engine. For example, a marine vessel may have two propulsion engines, therefore the *engines_installed* is 2 to count the total number of engines. In this case there would be two main engines, engine number 1 and engine number 2 noted in the *engine_number* column, as shown in Figure 4 below.

FIGURE 4: Example of how to enumerate engines on an equipment with two main engines

number	equipment_identifier	engines_installed	engine_number	main_or_aux	engine_baseline_or_reduced
Multi-Engine Project	Red Boat	2	1	main	reduced
Multi-Engine Project	Red Boat	2	1	main	baseline
Multi-Engine Project	Red Boat	2	2	main	reduced
Multi-Engine Project	Red Boat	2	2	main	baseline

Column for *equipment_baseline_or_reduced*: Off-Road and On-Road Replacement projects are unique within the database. These source categories contain two equipment data rows per piece of equipment, a baseline equipment and a reduced equipment. In these cases, the entire piece of old equipment (baseline) equipment is being replaced by a new piece of equipment (reduced). While other source categories contain only a replacement equipment data row that repeats, the templates for Off-road and On-Road Replacement must include distinct data for baseline and reduced equipment.

When creating baseline and reduced data, the baseline engines must be associated with their corresponding baseline equipment on the same row, and the reduced engines to the reduced equipment. To help ensure a successful import, it is essential to follow the import definitions exactly when entering these types of projects. Typically, both the import templates and the export file display the reduced data row over the baseline data row.

Multiple Equipment Replacement Imports: Projects with multiple-equipment, such as two-for-one vehicle replacement projects, must be entered manually into the non-calculation form via the web forms.

Usage columns for *miles_travel*: It is important to note that the on-road category has only miles_travel usage option to run its calculations.

Usage columns for *hours_operated* and *fuel_consumed*: For categories other than on-road, usage is identified through either *hours_operated* or *fuel_consumed*. Data are required for only one of these columns; if you fill one in, leave the other column blank.

- If the *hour_meter* column of the engine import template is set to [Y] for yes, then the *hours_operated* column must be populated in units of annual hours operated.
- If the *hour_meter* column is set to [N] for no, then the *fuel_consumed* column must be populated in units of annual gallons of fuel consumed.

Engine_make and engine_model: When importing engine make and model

information, the import utility will cycle thorough the existing list of makes and models currently saved in CARL. If the imported make or model is not found in the existing list, the import utility will save the imported make and model in the appropriate *other_engine_make* and *other_engine_model* columns respectively. Please note that the *other_engine_make* and *other_engine_model* columns will not export as they should not be imported. To view the "other" imported make and model data, visit the online web form.

Equipment_make and equipment_model*:* Please see engine_make and engine_model section above; the same logic applies to equipment_make and equipment_model columns.

Guideline **column:** The *guideline* column is a required field that determines the calculation method and emission factors the category will use. Enter [13] for 2011 Guidelines, [15] for the 2017 Guidelines in this column.

Non-Calculation Data: The *calculation_local* column determines whether CARL will or will not calculate emission reduction, cost effectiveness and maximum grant amount. This field is required and must be populated with [Y] for yes in the source category templates to designate a piece of equipment as one that requires a calculation, which will enable CARL to perform calculations on the data imported. However, for a piece of equipment where the non-calculation form is necessary, the user should populate this required field with [N] for no. The non-calculation form is necessary for equipment where there is no source category form, such as locomotive, emergency vehicle, shore power projects, or for case-by-case situations.

Comment Fields: In the CARL web forms there are three places to enter comments in CARL for any given project/equipment.

- *comments* field - found on the source category equipment forms,
- *project_comments* field - found on the first administration form, and
- *admin_comments* field - found on the second administration page.

All of these comment fields are included in the templates and are labeled as such. When importing comments it is important to check that the comment text does not contain hard returns, and special characters, as these will be recognized as special functions by the utility and will result in corrupt data.

District Grant Amount: The field *equipment_approved_amount* is a required field in the source category templates that represents the district's eligible grant amount. This column must be filled in to access the fiscal information associated with a piece of equipment. If the *equipment_approved_amount* column is not filled in for a piece of equipment, the district grant amount will default to the calculated maximum grant amount.

V.   EXPORTING

The CARL database is equipped with an export utility that can be used to view and edit data. The export utility has been revised to match the import template for clarity and ease in re-importing edited data. The export utility has several search filters that allow users to export specific data of interest (see Figure 5).

To export data from CARL, select the "Export" link on the gray bar. The Export Utility form will appear. The user can choose to export all columns included in a category or batch, or only the columns that contain entered data. Data can be exported in *.html* format for review in an online webpage form, or as a tab delimited text file that can be reviewed and edited in Excel.

FIGURE 5: Screen shot of the export page and the various search filters.

Working with a tab delimited text file: There are different applications available to view and manipulate text file data that the user may choose. Microsoft Excel is the most common. When a text file is downloaded from CARL, your system may automatically format the data in Excel. However, if the text data does not format automatically in Excel, the following steps will guide you through manually opening a text file in Excel.

1. When you export the tab delimited text file choose to save the file.
2. Open Excel and choose "open" from the "file" menu option. Navigate to the folder containing the text file you downloaded. If the text file is not visible in the folder, change the file type (pull-down menu) from Excel Files to All Files. Select the text file and the Text Import Wizard window will appear.
3. Follow the Text Import Wizard steps to delimit the columns by tab. Do not delimit the data by semicolon, comma, space or other as these characters may exist in a database field such as the comment field.

Please note that Excel may automatically change the format of data and often will reformat a project number containing a dash into a date format without warning. If this is an issue, turn off auto-formatting in Excel.

VI.   DATA VALIDATION

A critical step in the import process is validating the data that were imported. The import utility will upload specified data into the CARL database; however, the user is responsible for confirming that the data were imported correctly and that the imported data are valid. At a minimum, district staff should visit 20 percent of the imported data by source category when performing data validation.

A representative sample set of projects and equipment should be selected to validate in CARL. The sample set should also be diverse and comprehensive. Data accuracy should be cross checked to the district's database or spreadsheets. Data validation is essentially a three part process:

1. Validate Equipment Data:
   - Open the equipment in the online web forms to ensure all the data is rendering
   - Calculate and save the equipment to ensure the calculated values are what you expected to see and that the project is cost effective
2. Validate Administration Data:
   - Open data in the administration forms to ensure all the data is rendering
   - Save/submit data to ensure the imported information is valid
3. Validate data in the Required Reports:
   - Verify the imported projects are in the Required Reports
   - Count the number of projects
   - Count to check whether the number of engines is accurate
   - Ensure executed, expended or liquidated dollars are correct
   - Check that emission reductions are correct

Validate Equipment Data: To perform data validation, the user must open up the CARL online equipment web form for the selected imported data, and review the data to ensure all required fields render. The piece of equipment is confirmed as valid if the user is able to "Calculate & Save" the equipment data in the CARL online web form and the calculated values are valid.

If the CARL online web form does not allow the user to calculate and save the data for a particular piece of equipment, then there is an issue with the data. Typically the issue is either that required data are missing or that the conditions of the imported data are not valid. **Validate Administration Data:** To validate administration information, open the administration forms to ensure the data are rendering in the form as expected. Ensure that the required "*Fully-executed Contract Date*" is populated with a valid date and hit the "Save" button to go to

the second administration form. Be sure to check several equipment within the project if applicable.

On the second administration form, confirm that expected information is rendering. Specifically check that the post-inspection date is populated where applicable, that funding information is present, and that paid-in-full equipment has funding and payment information. Also confirm that the funding amount does not exceed the district grant amount, and that the payment amount does not exceed the funding amount. Hit the "submit" button on the second administration form to validate the data.

Validate project data in the Required Reports: Run the executed, expended and/or liquidated reports to ensure the imported data are showing up as expected. First, verify that the imported projects are on the applicable Required Reports. Count the number of projects to check whether the correct number was imported and funded.   In addition, count the number of engines to ensure it is accurate. Ensure the executed, expended and liquidated dollars amounts are correct, and check that the reported emission reductions are accurate. Cross check the executed, expended and liquidated amounts to the District database or tracking spreadsheets.

Data corrections: If issues are found with the imported data, those data may be corrected either by (1) deleting the project and reimporting the corrected project and administration data, (2) deleting the batch and reimporting the entire dataset, or (3) correcting the data in the online web forms.

Other validation tools include using the export utility, query tool or project reports to ensure the imported data are calculating.

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Please email the CARL Helpdesk at carlhelp@arb.ca.gov with any questions.